REMARKS

The Office Action dated November 27, 2007, has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

By this Response, claim 24 has been amended to more particularly point out and distinctly claim the subject matter of the present invention. No new matter has been added. Accordingly, 13-26 are currently pending in the application, of which claims 13, 24, 25, and 26 are independent claims.

In view of the above amendments and the following remarks, Applicant respectfully requests reconsideration and timely withdrawal of the pending claim rejections for the reasons discussed below.

Claim Rejections under 35 U.S.C. §112, Second Paragraph

The Office Action rejected claim 24 under 35 U.S.C. §112, second paragraph as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Specifically, the Office Action alleged that it is unclear whether the claims are directed towards a product or a method.

Accordingly, Applicant has amended claim 24 to more particularly point out and distinctly claim the subject matter of the present invention. Therefore, as presently recited, claim 24 recites limitations for "a computer-readable program product comprising a computer program code embodied on a computer-readable medium, the

computer readable product being configured to control a processor" and therefore, particularly points out and distinctly claims the subject matter of the present invention.

Therefore, Applicant respectfully submits that the rejection of claim 24 under 35 U.S.C. §112, second paragraph, is now moot in view of the claim amendments.

Claim Rejections under 35 U.S.C. §101

The Office Action further rejected claim 24 under 35 U.S.C. §101 as allegedly directed to two statutory categories; and therefore, it is unclear whether the claim is directed towards a product or a process.

Accordingly, Applicant has amended claim 24 to recite "a computer-readable program product comprising a computer program code embodied on a computer-readable medium, the computer readable product being configured to control a processor."

A claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. *See Lowry*, 32 F.3d at 1583-84, 32 USPQ2d at 1035 (MPEP §2106.01(I)).

Therefore, Applicant respectfully requests withdrawal of the rejection of claim 24 under 35 U.S.C. §101, and respectfully submits that claim 24 recites claim limitations directed to a single statutory category within the requirements of 35 U.S.C. §101.

Claim Rejections under 35 U.S.C. §103(a)

The Office Action rejected claims 13-26 under 35 U.S.C. §103(a) as being allegedly unpatentable as obvious over Guiver, *et al.* (U.S. Patent No. 5,809,490) ("Guiver") in view of Sirosh (U.S. Patent No. 6,226,408) ("Sirosh"). Applicant respectfully traverses the rejections for at least the following reasons.

Claim 13, upon which claims 14-23 depend, recites a computer-implemented method. The method includes determining cluster centers in a first data structure. The first data structure includes a lattice structure of weight vectors that create an approximate representation of a plurality of input data points. A plurality of the weight vectors represents a single non-linear cluster. The method further includes performing a first iterative process for iteratively updating the weight vectors such that the weight vectors move toward the cluster centers, performing a second iterative process for iteratively updating a second data structure utilizing results of the iterative updating of the first data structure, and determining, based on the second data structure, several sets of weight vectors in said lattice structure such that in each set, the weight vectors correspond to the same cluster centers of the input data points. The method is an unsupervised method that is configured to be suitable for an on-line system.

Claim 24 recites a computer-readable program product comprising a computer program code embodied on a computer-readable medium. The computer-readable program product is configured to control a processor to perform determining cluster centers in a first data structure. The first data structure includes a lattice structure of

weight vectors that create an approximate representation of a plurality of input data points. A plurality of the weight vectors represents a single non-linear cluster. The computer-readable program product is further configured to control a processor to perform performing a first iterative process for iteratively updating the weight vectors such that the weight vectors move toward the cluster centers, performing a second iterative process for iteratively updating a second data structure utilizing results of the iterative updating of the first data structure, and determining, based on the second data structure, several sets of weight vectors in said lattice structure such that in each set, the weight vectors correspond to the same cluster centers of the input data points. Executing the computer program is configured to carry out an unsupervised method that is configured to be suitable for an on-line system.

Claim 25 recites a computer. The computer includes first determination means for determining cluster centers in a first data structure. The first data structure includes a lattice structure of weight vectors that create an approximate representation of a plurality of input data points. A plurality of the weight vectors represents a single non-linear cluster. The computer further includes first performance means for performing a first iterative process for iteratively updating the weight vectors such that the weight vectors move toward the cluster centers, second performance means for performing a second iterative process for iteratively updating a second data structure utilizing results of the iterative updating of the first data structure, and second determination means for determining, based on the second data structure, several sets of weight vectors in said

lattice structure such that in each set, the weight vectors correspond to the same cluster centers of the input data points. The computer is configured to operate using an unsupervised method that is configured to be suitable for an on-line system.

Claim 26 recites a computer. The computer includes a first determination unit configured to determine cluster centers in a first data structure. The first data structure includes a lattice structure of weight vectors that create an approximate representation of a plurality of input data points. A plurality of the weight vectors represents a single non-linear cluster. The computer further includes a first performance unit configured to perform a first iterative process to iteratively update the weight vectors such that the weight vectors move toward the cluster centers, a second performance unit configured to perform a second iterative process to iteratively update a second data structure utilizing results of the iterative updating of the first data structure, and a second determination unit configured to determine, based on the second data structure, several sets of weight vectors in said lattice structure such that in each set, the weight vectors correspond to the same cluster centers of the input data points. The computer is configured to operate using an unsupervised method that is configured to be suitable for an on-line system.

As will be discussed below, Guiver in view of Sirosh fails to disclose or suggest every feature recited in claims 13-26, and therefore fails to provide the features of the claims discussed above.

Guiver is directed to an apparatus and method for selecting a working data set for model development. Guiver discloses a data selection apparatus that augments a set of

training examples with the desired output data. A data selection apparatus groups the augmented and normalized data set into related clusters using a clusterizer (Guiver, Abstract; col. 2, lines 19-29).

Sirosh is directed to an unsupervised identification of nonlinear data clusters in multi-dimensional data. Sirosh discloses a system including a vector quantization module, a weighted topology representing graph module, and an encoding module. The vector quantization module takes vector data inputs and extracts a group of inputs about a number of cluster centers, using a globally optimized clustering process. The weighted topology representing graph module creates a weighted graph of the vector space, using the cluster centers as nodes. The encoding module uses the weighted graph to recode the input vectors based on their proximity to the luster centers and the connectedness of the graph. The recoded vectors are re-input into the vector quantization module, and the process is repeated until termination, whereby the clusters identified may be highly non-linear in the original data space (Sirosh, Abstract; col. 2, lines 6-59).

Applicant respectfully submits that the Office Action fails to establish a *prima facie* case of obvious with respect to the features recited in claims 13 and 24-26.

As noted by the Office, Guiver fails to disclose or suggest, at least, "wherein a plurality of the weight vectors represents a single non-linear cluster" (See Office Action on pages 5-6). The Office Action alleged that Sirosh cures the deficiencies of Guiver, citing Figure 2 and column 4, lines 7-20). Applicant respectfully submits that one of ordinary skill in the art at the time the invention was made would not have found the

combination of the teachings of Guiver with the teachings of Sirosh obvious because the proposed modification of Guiver with the teachings of Sirosh would render Guiver unsatisfactory for its intended purpose.

It is readily apparent that Guiver is not proposing a new approach to clustering, but is using classical clustering algorithms to do this. In fact, the use of the term "SOM clusterizer" in Guiver is incorrect, or at least irregular, because the SOM's intended use is as a topology-preserving vector-quantization algorithm. From Sirosh, however, one of ordinary skill in the art would recognize that Guiver will not be able to find nonlinear data clusters from Guiver's data sets using the classical methods (*e.g.* SOM and K-means) proposed in Guiver.

Particularly, Sirosh, in Figure 2, illustrates a set of data items densely distributed as 2-dimension vectors in two intertwined spiral distributions, and surrounded by uniformly random noise of low density. Figure 2 further illustrates 10,000 points, of which 3,976 are associated together to form the inner spiral 202, and 4,096 are associated together to form the outer spiral 204. The remaining 1,958 are the uniform random noise. Sirosh further discloses that these two spirals are often used as a test case for "supervised" learning algorithms, such as nonlinear regression and back propagation networks (Sirosh, Figure 2, col. 4, lines 21-42). Further, Sirosh discloses that the data vectors are by their nature grouped into m relatively dense or cohesive clusters or data manifolds, Mj, j=0...m-1. These clusters may be highly nonlinear, perhaps wrapping or

folding around each other throughout the D dimensional vector space (Sirosh, column 4, lines 7-20).

Therefore, one of ordinary skill in the art at the time the invention was made would have understood that the SOM and k-means algorithms utilized in the SOM clusterizer of Guiver produce linearized clusters of data. Accordingly, one of ordinary skill in the art would have understood that incorporating the teachings for producing nonlinear clusters disclosed in Sirosh into the SOM or k-means algorithms of the SOM clusterizer disclosed in Guiver would render Guiver unsatisfactory for its intended purpose.

Further, contrary to the Office Action's assertions (See page 5), Applicants respectfully submit that Guiver at column 6, line 54, to column 7, line 8 fails to disclose or suggest, at least, "wherein the method is an unsupervised method that is configured to be suitable *for an on-line system*" as recited in claim 13, and similarly recited in claims 24-26 (*emphasis added*). Rather, at column 6, line 54, to column 7, line 8, Guiver merely discloses embodiments for the extractor for selectively moving data from its respective cluster and for the clusterizer used as a Kohonen self organizing map (SOM), where features of the SOM are discussed. Thus, Guiver fails to disclose or suggest, at least, "the method is an unsupervised method that is configured to be suitable *for an on-line system*" as recited in claim 13, and similarly recited in claims 24-26 (*emphasis added*).

Therefore, Applicant respectfully submits that the Office has failed to establish a *prima facie* case of obviousness with respect to the features recited in claims 13 and 24-26.

Claims 14-23 depend from claim 13. Accordingly, claims 14-23 should be allowable for at least their dependency upon an allowable base claim, and for the specific limitations recited therein.

Therefore, Applicant respectfully requests withdrawal of the rejections of claims 13-26 under 35 U.S.C. §103(a), and respectfully submits that claims 13 and 24-26, and the claims that depend therefrom, are in condition for allowance.

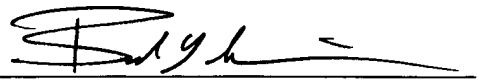
CONCLUSION

In conclusion, Applicant respectfully submits that Guiver and Sirosh, alone or in combination, fail to disclose or suggest every claim feature recited in claims 13-26. The distinctions previously noted are more than sufficient to render the claimed invention non-obvious. It is therefore respectfully requested that all of claims 13-26 be allowed, and this present application be passed to issuance.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, Applicant's undersigned representative at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, Applicant respectfully petitions for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



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